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ABSTRACT

A total of 80 infants who were 7 months old were asked to discriminate happy and surprised expressions based on compound or component changes in the eyes, mouth, or entire face. Four stimuli were employed: black and white photographs of a Caucasian female modeling happy and surprised expressions, and two hybrid expressions created by transposing eye and mouth regions from original stimuli. Ten infants were tested in each of eight recognition memory conditions. In four of the conditions, infants discriminated stimuli based on changes in a single component. In the remaining four conditions, infants were asked to recognize expression changes when compound changes occurred. The index of recognition was a novelty preference score, which was the total fixation time for the more novel pattern divided by the total fixation time for both the novel and familiar patterns. When the infants were asked to recognize the familiar expression in the component conditions, they were successful when the change occurred in the mouth region. In the compound change conditions, the infants were again most sensitive to changes in the mouth. When changes occurred in the eye region, the infants were unable to recognize the familiar expression. Results suggest that in both compound and component conditions, 7-month-olds discriminate the facial expressions based on information in the mouth region. (RH)

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Infants' recognition of facial expressions from partial features of the face.

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Infants' ability to discriminate facial expressions has been demonstrated in numerous experiments (see Nelson, 1987 for a review). However, in many of those studies it is unclear whether infants discriminated changes in affect per se or only responded to changes in the features of the face. The studies which have attempted to address this issue have yielded inconsistent results: Some reporting that infants attend to changes in the eyes (Nelson & Horowitz, 1980) and others that infants attend to the mouth region of the face (Oster & Ewy, 1980). However these inconsistencies are difficult to interpret because in both experiments the experimental design was incomplete such that only one feature was allowed to vary. In the present experiment the problems of incomplete design were addressed by asking 7-month-olds to discriminate happy and surprised expressions based on compound or component changes in the eyes, mouth, or entire face.

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Subjects were 80 7-month-olds (Mean postnatal age = 29.3 weeks; SD = 1.1; Range = 28 to 32 weeks). All were full term and there were no birth complications.

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Four stimuli were employed. All were black and white photographs of a Caucasian female model selected from the work of McGrath (1983). Two "original" expressions showed the woman modelling (1)Happy and (2)Surprised expressions. Two "hybrid" expressions were created by transposing the eye and mouth regions from the original stimuli; (3) one pattern was composed of surprised eye and a happy mouth and the other (4) was composed of happy eyes and a surprised mouth.

Ten infants were tested in each of eight recognition memory conditions. The stimuli and the experimental design are shown in Table 1. In four of the conditions infants discriminated stimuli based on changes in a single component: Two conditions were based on changes in the mouth only and two were based on changes in the mouth region only. These conditions replicated past experiments in that only one feature region was allowed to vary. In the remaining four conditions infants were asked to recognize expression changes when compound changes occurred. In other words, a compound change was when one or both features could vary. In two of these conditions changes in the eyes were focal and changes in the mouth were irrelevant. For the other two conditions the mouth changes were focal and eye changes were irrelevant. In half of the eight conditions the familiar stimulus was one of the original expressions and in the other half the familiar stimulus was a hybrid expression.

The general procedure employed a paired comparisons, novelty preference technique. Each infant was seated on his or her parent's lap and allowed to look at a presentation stage. An observer, out of the infant's view, recorded the amount of time the infant looked at each pattern. Infants were allowed to study a familiarization pattern until they had accumulated 20 seconds of looking time. Following the familiarization period, two test patterns, one with familiar features and the other with relatively more novel features, were paired for two 5-second periods with the left-right positions of the stimuli counterbalanced.

The index of recognition was a novelty preference score which was the total fixation time for the more novel pattern divided by the total fixation time to both the novel and familiar patterns. The novelty preferences for the eight conditions are shown in Table 1. The results of the Happy-Surprised comparison (patterns 1 & 4) come from McGrath (1983). When the infants were asked to recognize the familiar expression in the component conditions, they were successful when the change occurred in the mouth region. In the compound change conditions, the infants were again most sensitive to changes in the mouth. When changes occurred in the eye region, the 7-month-olds were unable to recognize the familiar expression. The results of this study suggest that in both compound and component conditions 7-month-olds discriminate the facial expressions based on information in the mouth region of the face.

Infants' attention to the mouth region of the face could be due to several factors. First, changes in the mouth region involve larger muscles than do changes in the eyes. Thus, mouth changes may be easier to see and be more salient to infants. Second, in the case of these particular expressions, the critical information for making the discrimination may be contained in the mouth region. One might speculate that for other pairs of expressions, anger and fear for example, the critical information for the discrimination might be contained in the eye region.

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Familiar	Novel	Foil	Novelty Preference	SD	N	t
1	2	1	52.7	17.4	20	0.68
2	1	2				
1	3	1	59.3	15.4	20	2.70**
3	1	3				
1	4	3	54.8	13.0	20	1.65
2	3	4				
1	4	2	59.2	18.2	20	2.25**
3	2	4				
1	4	1	65%			

* sg. at .05 for one-tailed test
**sig at .05 for two-tailed test